

Remarks:

Applicants acknowledge receipt of the Office Action of October 3, 2008, in which the Examiner rejected claims 1, 2, and 4 as obvious in view of Moe (US 4669650, "Moe '650") in combination with Denneen (US 2604569); rejected claims 5-9 as obvious over Moe '650 and Denneen in view of Masakatsu (JP 03-243286); and rejected claims 10-12 as obvious over Moe '650, Denneen, and Masakatsu in view of US 3941299 to Godfrey.

Applicants respectfully traverse the rejections for the reasons set out below.

Rejection of claims 1, 2, and 4 as obvious in view of Moe '650 in combination with Denneen

Applicants maintain their position that the teachings of Denneen do not relate to an end wall and do not follow the Examiner's assertion that "the circumferential face of the wall still reads on 'the end face of the wall.'" Applicants respectfully request that the Examiner clarify the rejection. Nonetheless, Applicants submit the following alternative arguments demonstrating the patentability of the current claims.

In support of the rejection, the Examiner states that Moe teaches a method for interconnecting tubulars by forge welding, comprising

"shaping the tubular ends that are to be welded together into an inwardly sloping configuration, in which the sloping configuration is such that when the tubular ends are heated during the forge welding process the heated tubular ends deform as a result of thermal expansion into a substantially longitudinally oriented cylindrical shape, wherein the sloping angle of the inner and outer walls of the tubular ends is selected such that the ratio between the average diameter D(t) of the tip of the tubular end and the average diameter D(b) of the base of the tubular end is related to an estimated temperature difference between said tip and base of the tubular end during the forge welding process and a thermal expansion coefficient of the steel grade or grades of the tubular end."

The Examiner cites col. 1, ll. 5-6 and col. 3, ll. 11-15 and 24-26 of Moe '650 in support of this assertion. Applicants respectfully submit, however, that the cited passages in Moe '650 do not come close to disclosing all of the subject matter for which they are relied upon.

Moe '650 relates generally to forge welding and specifically to reducing the cross-section of the parts eccentrically before welding and flushing with gas during welding.

Col. 1, ll. 5-6 of Moe '650 reads, "*The present invention relates to method for joining tubular parts of metal by forge/diffusion welding.*"

Col. 3, ll. 11-15 reads, *“Here the joint 3 has the form of a wedge. The arrows F indicate a variable force for pressing the parts together, while the bellshaped curve to the left of the parts 1 and 2 indicates the axial temperature distribution in these parts.”*

Finally, col. 3, ll. 24-26, reads *“It will be seen that the parts 1, 2 are given reduced cross-section in the joint area. This is done in order to more easily obtain a tri-axial stress condition in the joint area when the material, during the pressing together of the parts, flows so that these obtain the [cylindrical] form shown in FIG. 3.”* (emphasis and adjective added).

A careful read of the above passages, alone or in combination with the rest of the specification of Moe ‘650, reveals no teaching or suggestion that the parts can be preformed such that they into a substantially longitudinally oriented cylindrical shape deform as a result of thermal expansion, as required by claim 1. Instead, Moe ‘650 teaches that the parts achieve a cylindrical shape (FIG. 3) after welding and as a result of the material flowing during welding. While it is possible that the parts may also experience thermal expansion, it is not mentioned by Moe and there is no suggestion that the thermal expansion should be factored into the design of the parts so that they have a longitudinally oriented cylindrical shape as a result of thermal expansion.¹

Denneen also makes no teaching or suggestion relating to the use of thermal expansion in combination with a preselected formation of the parts to be welded.

Thus, claim 1 as it currently stands is distinguishable over Moe ‘650, Denneen, and any combination of those references. The remainder of the claims, which all depend from claim 1, are distinguishable for at least the same reasons.

Rejection of claims 5-9 as obvious over Moe ‘650 and Denneen in view of Masakatsu

Because claim 1 is patentable over the art of record, Applicants respectfully submit that claims 5-9 are also allowable.

¹ Applicants submit herewith a Replacement Drawing Sheet containing Figures 1 and 2. Figure 2 has been partially redrawn in order to more clearly illustrate the contrast between Figure 2 (and Figures 4a and 4b, in which the unheated pipe ends are shown, and Figure 1, in which the heated ends are shown.

Rejection of claims 10-12 as obvious over Moe '650, Denneen, and Masakatsu in view of Godfrey

Because claim 1 is patentable over the art of record, Applicants respectfully submit that claims 10-12 are also allowable.

Conclusion

Applicants thank the Examiner for the thoroughness of the Office Action. Applicants believe that the present amendment and arguments place the case in condition for allowance.

If it would be considered helpful in resolving any issues in the case, the Examiner is encouraged to contact the undersigned at the number below.

Respectfully submitted,

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